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ORCID ID: https://orcid.org/0000-0001-6884-3504

Uncovering the multifaceted challenges and practical strategies in teaching elementary mathematics

Melvil John B. Icuspit: Student, Graduate School of Education, Divine Word College of Laoag, Laoag City, Ilocos Norte, Philippines.

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A B S T R A C T

This study uncovered the multifaceted challenges and practical strategies employed by elementary teachers in teaching mathematics. Focused on real classroom experiences, it aimed to understand the persistent difficulties encountered in delivering mathematical concepts to young learners, including issues related to student engagement, conceptual understanding, and the availability of instructional resources. Through reflective journal entries guided by open-ended questions, teachers shared insights into the specific struggles they faced—ranging from gaps in prior knowledge to behavioral concerns and curriculum demands. The study also highlighted effective strategies teachers have developed or adopted, such as the use of manipulatives, visual aids, group work, and differentiated instruction to support learning. Findings underscored the importance of context-based, flexible, and learner-centered approaches in addressing diverse student needs in math education. Ultimately, this research offers practical implications for improving mathematics instruction in elementary settings and supports continuous professional growth among educators.

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Introduction

Teaching mathematics in the elementary classroom is often viewed as both a complex puzzle and a dynamic performance. Educators are expected not only to deliver abstract concepts effectively but also to maintain student engagement, cater to varied learning styles, and adapt to limited resources. These demands have pushed teachers to explore a range of strategies that combine structure, creativity, and responsiveness to learners' needs.

In the Filipino context, Oledan et al. (2025) highlighted a shift toward open-ended tasks in math classrooms. Teachers reported that giving students opportunities to explore multiple solution paths and create their own problem-solving strategies boosted critical thinking and engagement—but also revealed the need for more sustained professional development. Closer to home, Ceniza and Samocino (2023) introduced the "Imagery Ordonnance Method" inspired by Singapore Math. When Grade 3 teachers

* *Corresponding author. ORCID ID: 0000-0001-6884-3504*
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implemented this visual technique, they reported increased confidence in teaching problem-solving and saw a more vibrant, interactive classroom environment emerge

Additionally, Caballero et al. (2025) investigated how contextualized learning materials and differentiated instruction influence student outcomes. Their study demonstrated that aligning math tasks with real-life scenarios and adjusting instruction for different learners significantly improved mathematical performance among elementary students.

Ong and Escareal (2023) examined the impact of the Concrete–Pictorial–Abstract (CPA) approach on Grade 3 pupils' mathematics performance in Ozamiz City. Their action research revealed that progressing from concrete manipulatives to pictorial representations and finally to abstract symbols significantly enhanced learners' problem-solving skills, motivation, and positive attitudes toward mathematics.

Studies have examined the challenges and strategies in teaching elementary mathematics; most have focused on general contexts without fully addressing the specific realities of teachers. For instance, Reyes and Mendoza (2020) investigated the struggles of elementary teachers in rural schools in Luzon, noting issues such as lack of instructional materials, limited time for mastery, and insufficient training. While their findings provide valuable insights, they do not capture how these challenges manifest in the localized setting where learner diversity, resource constraints, and language barriers are persistent realities. Furthermore, limited research has documented how teachers in this specific context adapt and innovate their strategies to meet varied learner needs. Addressing this gap can generate context-driven, school-specific insights that inform more practical approaches to mathematics instruction and guide targeted professional development programs.

This research aimed to uncover the struggles and strategies of elementary mathematics teachers, particularly those at Hilario Valdez Memorial Elementary School, where diverse learner needs and limited resources are everyday realities. Knowing the teachers' vast experiences in teaching, this study sought to uncover effective, context-based practices that can enhance learner engagement and mathematical understanding. Ultimately, the goal was to provide insights that not only reflect classroom realities but also inform professional growth and contribute to improving math instruction in similar educational contexts.

Review of related literature

This review of literature provides a foundation for examining the current study, which focuses on the dual themes of multifaceted challenges and practical strategies employed by elementary mathematics teachers.

Challenges of teachers in teaching mathematics

Teaching mathematics in elementary classrooms presents ongoing challenges that have been widely documented in both local and international research. Teachers frequently struggle with delivering

abstract concepts, accommodating diverse learning needs, and engaging students meaningfully in problem-solving tasks (Baroody et al., 2018).

A study by Reyes and Mendoza (2020) examined the experiences of public elementary school teachers in Luzon, Philippines, revealing that lack of instructional materials, limited time for concept mastery, and insufficient training in innovative teaching methods were among the most common barriers to effective math instruction. Teachers expressed the need for continuous professional development and collaboration to overcome these difficulties.

Meanwhile, Bautista and Salonga (2019) highlighted how learner diversity, especially in multi-grade classes, compounded the difficulty of delivering grade-appropriate content. They found that teachers in multi-grade classrooms often had to integrate and modify curriculum objectives across different levels, requiring flexible lesson planning and creative teaching strategies. Moreover, the study revealed that teachers frequently utilized community-based examples and localized experiences to contextualize math instruction, which helped maintain student interest and participation despite limited resources.

In addition, Aquino, Barong, Sapotalo, and Panerio Jr. (2025) compared the challenges faced by mathematics teachers in urban and rural public elementary schools in Digos City, Philippines. Through interviews with 10 math teachers, they found that rural teachers struggled with limited access to instructional materials and weak foundational skills among students, while urban teachers contended with overcrowded classrooms and disparities in grade progression and proficiency. Despite their different settings, both groups experienced difficulty in addressing varying learning paces within time-constrained curricula. The study recommends e-learning integration, differentiated teaching, innovation in instructional practices, peer collaboration, and ongoing professional development for teachers in both rural and urban contexts.

Valle (2025) surveyed 68 public elementary mathematics teachers across four Philippine schools to identify post-pandemic challenges in planning, lesson execution, assessment, content knowledge, and use of technology. The descriptive survey revealed that teachers struggled with redesigning lesson plans for hybrid learning, implementing effective assessments, integrating digital tools, and maintaining depth of mathematical understanding in rapidly changing instructional contexts.

Tolibas (2023) explored the challenges of teaching mathematics using the Winaray language as medium of instruction in elementary public schools. Using phenomenological interviews, the study found that teachers encountered difficulty translating complex mathematical terminology, leading to diminished student comprehension. While using the mother tongue enhanced engagement, it also risked misunderstanding of abstract concepts. The study suggests multilanguage strategies, tailored instruction, and refined curriculum materials to support math instruction across linguistic contexts.

Baquiller & Abellon Jr. (2021) investigated the problems elementary teachers faced when teaching mathematics through their mother tongue (MT), as part of the MTB-MLE policy. Surveying 33 teachers and seven principals, they identified serious issues in translating English-based math terms, content delivery in MT, and delays in receiving instructional materials. Teachers often resorted to code-

switching, using pictures, and producing materials using school funds. They recommended equipping teacher training with MTB-MLE pedagogy, streamlining material delivery, and enhancing material availability.

Globally, Anthony and Walshaw (2018) stressed the role of teacher beliefs and self-efficacy in math instruction. Teachers who viewed mistakes as learning opportunities and encouraged student exploration tended to create more supportive and effective learning environments. This was supported by findings from OECD (2021), which noted that teachers who integrate formative assessments and flexible grouping strategies often see improved student engagement and performance.

Strategies used by teachers in teaching mathematics

Bautista and Salonga's (2019) research emphasized that differentiated instruction, peer learning, and contextualization were effective strategies used by teachers to bridge gaps in understanding. In classrooms with multiple grade levels, teachers implemented differentiated instruction by adjusting activities to match students' diverse abilities, frequently utilizing tiered assignments or modular worksheets so that each student could progress at their own speed. Peer learning was promoted by pairing older or more proficient students with younger or less experienced peers, which aided those needing extra help and promoted teamwork and leadership skills. Furthermore, teachers made math lessons more relatable by incorporating examples from everyday local life—such as shopping at markets, farming practices, or managing household budgets—making abstract concepts more tangible and increasing engagement, particularly for students who were less interested. These approaches were essential for addressing challenges caused by constraints in time, resources, and curriculum overlap.

Recent developments in the use of technology in math classrooms have also reshaped teaching strategies. As noted by Cruz and Villanueva (2022), digital tools such as virtual manipulatives and interactive math games have enhanced conceptual understanding among Filipino learners. However, the study also cautioned that effective integration requires sufficient training and access to resources.

In the local context, Garcia et al. (2023) reported that the use of culturally relevant examples and mother-tongue instruction in math significantly helped early-grade learners grasp basic arithmetic concepts. Teachers found that connecting mathematical content to students lived experiences boosted motivation and comprehension. The research highlighted that students are more engaged and grasp abstract math concepts, such as number operations and measurement, more effectively when mathematical problems are set in familiar contexts—like shopping at a local market, measuring ingredients for cooking, or counting livestock on a farm. By connecting math lessons to students' daily lives, this culturally relevant teaching approach made learning more meaningful and relatable. Additionally, Garcia et al. (2023) investigated the use of culturally relevant examples and mother-tongue instruction in mathematics among early-grade learners in rural Philippine schools. Lessons incorporated familiar contexts such as local market shopping, farming tasks, and cooking measurements, all delivered in the pupils' native language. Data from classroom observations and comprehension assessments indicated that these approaches improved understanding of abstract concepts like measurement and operations. Teachers reported that the method also reduced barriers caused by unfamiliar terminology and increased learner participation.

Ong and Escareal (2023) examined the impact of the Concrete–Pictorial–Abstract (CPA) approach on Grade 3 pupils' mathematics performance in Ozamiz City, Philippines. Conducted as classroom action research over one academic quarter, the intervention followed a three-phase progression—starting with concrete manipulatives, moving to pictorial representations, and concluding with abstract symbols. Results from pre- and post-tests revealed significant improvements in problem-solving accuracy, conceptual understanding, and computation speed. Teachers also reported heightened motivation and participation among pupils, as well as reduced math anxiety during lessons.

Dela Cruz and Bautista (2022) implemented a CPA-based lesson study to address misconceptions in fractions among Grade 4 pupils in Las Piñas City. Over a series of co-planned and observed lessons, pupils engaged with concrete fraction models (such as paper folding), transitioned to visual diagrams, and then solved symbolic fraction problems. Teachers emphasized real-time processing of student responses and cross-subject connections to reinforce learning. Findings showed marked reductions in common errors, better reasoning in fraction comparisons, and greater confidence in explaining solutions, not just providing answers.

Villanueva and Cruz (2022) explored the integration of digital tools—such as virtual manipulatives, interactive math games, and online quizzes—into Grade 5 mathematics lessons in Metro Manila public schools. The quasi-experimental design compared traditional instruction with tech-integrated lessons over six weeks. Results indicated significant gains in conceptual understanding, especially in geometry and fractions, for the experimental group. The study stressed that adequate teacher training and consistent access to devices were critical for maximizing the benefits of technology in math instruction.

Taken together, the literature suggests that while elementary math teachers face persistent struggles—such as inadequate resources, learner variability, and limited instructional time—they also develop and adopt a range of practical strategies. These include differentiated instruction, contextualized learning, visual modeling, game-based tasks, and collaborative problem-solving—all aimed at supporting diverse learners in understanding mathematical concepts effectively.

Statement of the problem

This study aimed to explore the struggles and strategies of elementary teachers in teaching mathematics. It specifically sought to answer the following problems:

1. What are the multifaced challenges encountered by teachers in teaching elementary mathematics?

2. What are the practical strategies employed and implemented by teachers in teaching elementary mathematics?

Research methodology

This chapter presents the research design, sources of data which includes the locale of the study, population and sampling, data gathering instrument and data analysis including its ethical standards.

Research design

This study employed a qualitative research design, specifically a narrative inquiry approach, to explore the lived experiences of elementary teachers in teaching mathematics. The goal was to uncover their personal stories, challenges, and the strategies they use to effectively teach math concepts in their classrooms.

Locale of the study

The research was conducted at Hilario Valdez Memorial Elementary School, a public school located in the Schools Division of the City of Batac, Ilocos Norte. This school was selected due to its active engagement in teaching innovation and its diverse student population.

Population and sampling

The participants of the study were mathematics teachers at Hilario Valdez Memorial Elementary School. A purposive sampling technique was employed to select ten teachers who have experiences in teaching mathematics and have demonstrated involvement in instructional improvement or participated in math-related training.

Data gathering instrument

The main instrument for data collection was an open-ended questionnaire divided into three main sections: experiences in teaching mathematics, strategies and innovations used, and professional support needs. Follow-up informal interviews were also conducted to probe deeper into their responses.

Data gathering procedure

Data were collected through open-ended questionnaires distributed to participating teachers. These questionnaires were designed to encourage reflective and narrative responses, allowing teachers to describe their experiences in detail. Some responses were followed up with informal interviews to clarify and expand on the information provided.

Ethical considerations

The study observed ethical research practices. Informed consent was obtained from all participants. Responses were kept confidential and used solely for the purpose of this study. Participants were informed of their right to withdraw at any time without any consequence.

Results and discussion

This section presents the insights gathered from the open-ended responses of elementary mathematics teachers at Hilario Valdez Memorial Elementary School. Through their narratives, the recurring struggles and corresponding strategies in teaching mathematics are illuminated.

Problem 1: What are the multifaced challenges encountered by teachers in teaching elementary mathematics?

Table 1. Teachers' challenges in teaching mathematics

Theme 1: Challenges in teaching mathematics	
Merged idea/struggle	**Participant**
Learners have difficulty in basic math operations and foundational skills	P3, P6, P10
Students experience math anxiety, low confidence, or fear of math	P5, P10
Difficulty addressing varied learning styles and levels	P1, P4, P9
Poor vocabulary and reading comprehension affecting understanding	P2
Difficulty sustaining attention and managing behavior	P4, P8
Difficulty applying math to real-life situations	P9
Language/context barriers	P7
Theme 2: Areas of difficulty and challenges	
Merged challenge area	**Participant**
Introducing abstract concepts and ensuring deep understanding	P1, P2, P3, P4
Problem-solving and assessing true understanding	P1, P2
Managing diverse learners and behavioral challenges	P4, P5, P8
Lesson planning requires more time and adaptation due to difficulties	P1, P2, P3, P4, P5
Multisubject teaching difficulties (Math, English, Filipino)	P2
Struggles due to lack of student motivation and engagement	P4, P5

Note. Data were gathered from open-ended questionnaire responses and follow-up informal interviews with ten mathematics teachers from Hilario Valdez Memorial Elementary School

Theme 1: Challenges in teaching mathematics

This theme centers on the general struggles in teaching mathematics, particularly the difficulty of addressing learners with varying levels of understanding, maintaining motivation, and navigating constraints such as time, resources, and language barriers.

"One of the main challenges I face is addressing the varied levels of mathematical understanding among learners. Some pupils grasp the concepts quickly, while others struggle with foundational skills such as basic multiplication or problem-solving strategies. Maintaining their interest and motivation, especially in word problems, is also a recurring challenge." (*P1)*

"The most significant challenge I face is the declining ability of elementary learners to analyze and critically think when solving math problems. Many struggles with applying mathematical concepts to real-world situations or solving word problems that require more than just rote memorization of formulas. Another challenge is the varying learning paces and styles within a single classroom. Some students grasp concepts quickly, while others require more time and individualized attention. Finally, limited resources, such as manipulatives and technology, can hinder effective teaching." (P4)

This echoes the findings of Reyes and Mendoza (2020), who noted that instructional gaps often arise when teachers must adjust lessons to suit different learners without adequate time or support. Similarly, Bayaga and Wadesango (2021) found that teachers working in large, mixed-ability classrooms face consistent difficulties in keeping all students engaged.

"*A challenge for me is that my students are not on the same level; while some can already recognize numbers, others still need more focus and support before they can move to the next level, which makes it hard to address all their needs at once." (P10)*

This supports the observation by Hodgen et al. (2020) that unequal access to materials deepens learning disparities and makes effective teaching harder in under-resourced schools.

Recent research by Bayaga & Wadesango (2021) found that mathematics teachers often face difficulty managing diverse learner abilities, particularly in overcrowded classrooms with limited teaching aids. Similarly, Education Development Trust (2020) emphasized that addressing learner variability remains a key concern in low-resource settings, where individualized attention is difficult to sustain. Hodgen et al. (2020) also identified inequitable access to resources as a major contributor to disparities in mathematical achievement.

Theme 2: Areas of difficulty and challenges

This theme explores specific areas where teachers experience the most difficulty. These include introducing abstract mathematical concepts, assessing deeper understanding, and promoting critical thinking skills in learners who often rely heavily on memorization.

"*I find it most difficult when introducing abstract mathematical concepts, such as fractions, place value, or multi-step word problems. It's also challenging when pupils rely too much on memorization rather than understanding the process or logic behind the solution." (P1)*

"My greatest difficulty lies in addressing the lack of analytical and critical thinking skills among my students. This impacts their ability to solve complex problems and understand the underlying logic of mathematical concepts. Furthermore, differentiating instruction to meet the diverse learning needs of my students, particularly those who struggle with foundational skills, requires significant time and effort." (P4)

These statements reflect what Boaler (2022) emphasized: that math instruction focused too heavily on memorization can increase anxiety and hinder deeper learning. Likewise, Cheema and Kitsantas (2021) found that procedural teaching alone does not develop students' metacognitive or critical thinking skills, making it harder for them to approach non-routine problems with confidence.

"Mathematics especially problem solving... Some of the learners are not interested in the subject. Because they think it's difficult." (P8) This supports OECD (2021) findings that student disengagement often stems from a lack of meaning-making in math tasks—where learners are taught to get the answer rather than understand the process behind it.

"I experience the most difficulty in maintaining consistent engagement among diverse learners, especially when addressing varying learning styles and attention spans." (P3)

"Assessing true understanding beyond correct answers can be difficult. Sometimes, learners get the right answer but cannot explain their reasoning. Another difficulty is encouraging pupils to persevere through challenging problems rather than giving up quickly." (P1)

"Catering to students with varying math abilities and learning styles." (P3)

Boaler (2022) emphasizes that focusing on memorization without conceptual understanding reinforces math anxiety and weakens problem-solving abilities. Cheema & Kitsantas (2021) further argue that teaching methods relying heavily on procedures and rote learning hinder students' development of metacognitive and critical thinking skills. OECD (2021) findings confirm that learners who engage in meaning-making strategies outperform those who depend on formulaic recall.

Problem 2: What are the practical strategies employed and implemented by teachers in teaching elementary mathematics?

Table 2. Teachers' strategies in teaching mathematics

Theme 1: Strategies and approaches employed by teachers in teaching mathematics	
Response/outcome observed	**Participant**
Concrete-Pictorial-Abstract (CPA) approach	P1
Real-world applications and contextualization	P3, P4, P5
Hands-on activities and use of manipulatives	P3, P4, P5
Visual aids and differentiated instruction	P2, P3
Problem-based learning and inquiry	P4
Consistent repetition and scaffolding	P3
Theme 4: Response in the strategies and approaches in teaching mathematics	
Response/outcome observed	**Participant**
Improved student engagement and participation	P1, P3, P4, P5
Helped address learning gaps and abstract thinking	P1, P2, P3
Better lesson delivery and organized teaching flow	P2, P3
Enhanced classroom management and reduced stress	P4, P5
Provided equity for diverse learners	P4, P5
Effective communication and parent involvement	P3
Demonstrated success through real-life examples or learning outcomes	P1, P2, P3, P4, P5

Note. Data were gathered from open-ended questionnaire responses and follow-up informal interviews with ten mathematics teachers from Hilario Valdez Memorial Elementary School

Theme 1: Strategies and approaches in teaching mathematics

This theme highlights the strategies and approaches teachers implement to address these challenges. These range from the use of concrete-pictorial-abstract (CPA) methods and real-life applications, to collaborative learning, games, and differentiated instruction.

"Problem solving is indeed the most difficult part to teach in Math, especially for young learners who are still developing their reading comprehension and critical thinking skills. To help my students understand mathematical concepts and become better problem solvers, I use the following strategies: Use of Visuals and Manipulatives, Step-by-Step Modeling, Use of the "4-Step Problem Solving" Method, and Incorporating Games and Technology." (P2)

"Using concrete-pictorial-abstract (CPA) approach, math games, group activities, and real-life application of math concepts have been the most effective. I also use scaffolding and step-by-step guided examples before letting them solve independently." (P1)

"Hands-on activities and manipulatives: Using concrete materials helps students visualize abstract concepts and makes learning more engaging. Real-world problem-solving: Applying mathematical concepts to real-life situations helps students see the relevance of what they're learning and improves their understanding. Collaborative learning and group work: Working together allows students to learn from each other, share ideas, and develop their communication skills. Differentiated instruction: Providing different levels of support and challenge based on individual student needs helps ensure that all students can succeed. Game-based learning: Incorporating games and activities makes learning more fun and engaging, which can improve student motivation and retention." (P4)

"Use of manipulative and visual aids, using real object, step by step modeling, real life application." (P8)

Trinter & Hughes (2022) found that manipulatives and CPA strategies significantly improve understanding of math concepts, particularly among early learners. Chen et al. (2021) highlighted that contextualizing math through real-life applications boosts relevance and learning retention. Additionally, Lindmeier et al. (2020) support the use of collaborative and differentiated instruction to meet the needs of mixed-ability classrooms and promote active engagement.

Theme 2: Response in the strategies and approaches in teaching mathematics

This theme presents the impact of these strategies on lesson planning, classroom management, and student behavior. Teachers shared how these approaches have made lessons more interactive, reduced off-task behavior, and allowed for more efficient and purposeful material preparation.

"These strategies have made my lessons more interactive and less teacher centered. They help minimize off-task behavior because pupils are more engaged. As for materials, I now prepare visual aids and games that can be reused, making preparation more efficient in the long run." (P1)

"These strategies improved my lesson delivery by making concepts easier to explain and understand. They help with classroom management by keeping students engaged and reducing misbehavior. They also guide me in preparing effective, level-appropriate materials that meet my learners' needs." (P2)

"These strategies provide differentiated support, simplify complex concepts, and keep students engaged, which helps address gaps in understanding and reduce frustration." (P3)

"The strategies I've implemented have significantly improved my lesson delivery by making it more engaging and interactive. I now incorporate more hands-on activities, group work, and real-world problem-solving scenarios. This has also improved classroom management as students are more actively involved and less likely to disengage. Finally, the preparation of instructional materials is now more focused on creating differentiated resources that cater to diverse learning styles and needs, leading to more effective teaching." (P4)

"*Step-by-step guided practice helps manage different learning paces. This approach helps me reach more pupils effectively and keep the classroom environment positive and active." (P7)*

"These teaching strategies directly respond to the challenges I face by addressing both the learning needs of learners and the difficulties during lesson planning and behavior management." (P8)

"Using visual aids and hands-on materials helps students stay focused and understand faster." (P5)

Lee & Lee (2022) reported that student-centered math instruction—emphasizing manipulatives, real-life examples, and peer collaboration—significantly improves behavior and engagement. According to Education Endowment Foundation (2021), differentiated instruction and formative assessment practices allow teachers to better meet students where they are, leading to improved learning outcomes and classroom climate. Kaur & Wong (2020) also observed that structured and scaffolded instruction increases motivation and task persistence among learners with low confidence in mathematics.

Conclusion

This part of the study brings together the key insights drawn from the responses and experiences shared by elementary teachers. It highlights the ongoing difficulties they face in teaching mathematics and the practical ways they try to overcome them.

One of the biggest challenges identified is the need to adjust instruction for pupils with varying abilities. Teachers also struggle with limited resources, abstract math topics, student behavior, and lack of interest—especially when it comes to solving word problems. Planning lessons that cater to every learner, preparing the right materials, and dealing with time constraints add more weight to their already full plates. In many cases, language and reading comprehension barriers make it even harder for students to understand what math problems are asking them to do.

Despite these challenges, teachers are doing their best to adapt. They shared several strategies that have worked well in their classrooms, such as using hands-on materials, applying math to real-life situations, incorporating games, and breaking down lessons into visual and concrete steps before moving to abstract ideas. Group work, differentiated instruction, and scaffolding have also helped them support learners with different needs. Most importantly, teachers noted the value of being flexible and willing to reflect on and improve their teaching practices.

The findings point to a clear need for more support—from training programs to better access to teaching tools and opportunities to collaborate with fellow educators. Even though the challenges are real and persistent, what stands out is the teachers' dedication and creativity. Their commitment makes a difference in helping students not just learn math, but understand it in a meaningful way.

This study adds to the ongoing conversation about how to improve math education. It offers real examples of what works in the classroom and can help inform future strategies and policies that aim to better support both teachers and learners.

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